New phase-fitted and amplification-fitted modified Runge-Kutta method for solving oscillatory problems

ABSTRACT

In this paper, a new phase-fitted and amplification-fitted modified Runge-Kutta (MRK) method is constructed to solve first-order ordinary differential equations with oscillatory solutions. This new method is based on the Runge-Kutta Zonneveld method with fourth algebraic order. The numerical results for the new method have been compared with other existing methods. Findings have shown that the new method is more efficient than the other existing methods.

Keyword: Amplification-fitted and periodic solutions; Phase-fitted; Runge-Kutta methods